

PATENT COOPERATION TREATY

PCT

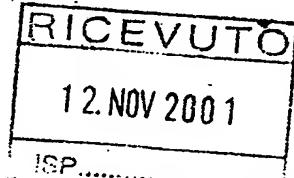
NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

RAMBELLINI, Paolo
Jacobacci & Partners S.p.A
Corso Regio Parco, 27
I-10152 Torino
ITALIE



Date of mailing (day/month/year)		
01 November 2001 (01.11.01)		
Applicant's or agent's file reference		
PC324PR		
International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/EP01/01762	16 February 2001 (16.02.01)	26 April 2000 (26.04.00)
Applicant	PERFETTI S.P.A. et al	

IMPORTANT NOTICE

1. Notice is hereby given that the International Bureau has **communicated**, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AG,AL,AM,AP,AT,AU,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,
ES,FI,GB,GD,GE,GH,GM,HR,HU,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,
MK,MN,MW,MX,MZ,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,
YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 01 November 2001 (01.11.01) under No. WO 01/80661

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and the PCT Applicant's Guide, Volume II.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.91.11

PATENT COOPERATION TREATY

Bee

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)Date of mailing (day/month/year)
20 November 2001 (20.11.01)

From the INTERNATIONAL BUREAU

To:

RAMBELLi, Paolo
Jacobacci & Partners S.p.A.
Corso Regio Parco 27
I-10152 Torino RICEVUTO
ITALIE

28.NOV.2001

Applicant's or agent's file reference
PC324PR

IMPORTANT NOTIFICATION

International application No.
PCT/EP01/01762International filing date (day/month/year)
16 February 2001 (16.02.01)

1. The following indications appeared on record concerning:

 the applicant the inventor the agent the common representative

Name and Address

PERFETTI S.p.A.
Via XXV Aprile, 7
I-20020 Lainate
Italy

State of Nationality

IT

State of Residence

IT

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

 the person the name the address the nationality the residence

Name and Address

PERFETTI VAN MELLE S.p.A.
Via XXV Aprile, 7
I-20020 Lainate
Italy

State of Nationality

IT

State of Residence

IT

Telephone No.

Facsimile No.

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

 the receiving Office
 the International Searching Authority
 the International Preliminary Examining Authority

 the designated Offices concerned
 the elected Offices concerned
 other:
The International Bureau f WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Ning XU

nyds

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

PENT COOPERATION TREA

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)Date of mailing (day/month/year)
29 August 2001 (29.08.01)

From the INTERNATIONAL BUREAU

To:

RAMBELLi, Paolo
Jacobacci & Partners S.p.A
Corso Regio Parco, 27
I-10152 Torino
ITALIEApplicant's or agent's file reference
PC324PR

IMPORTANT NOTIFICATION

International application No.
PCT/EP01/01762International filing date (day/month/year)
16 February 2001 (16.02.01)

1. The following indications appeared on record concerning:

 the applicant the inventor the agent the common representative

Name and Address

RAMBELLi, Paolo
Jacobacci & Perani S.p.A.
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I-10152 Torino
Italy

State of Nationality

Telephone No.

(39)(011) 2440311

Facsimile No.

(39)(011) 286300/676

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

 the person the name the address the nationality the residence

Name and Address

RAMBELLi, Paolo
Jacobacci & Partners S.p.A.
Corso Regio Parco, 27
I-10152 Torino
Italy

State of Nationality

Telephone No.

(39)(011) 2440311

Facsimile No.

(39)(011) 286300/676

Teleprinter No.

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer

David LOPEZ-RAMIREZ

Telephone No.: (41-22) 338.83.38

PCT

EPO-Munich
24
19. Feb. 2001

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
PCT/EP 01/01762	
International Application No.	
(16.02.01)	16 FEB 2001
International Filing Date	
EUROPEAN PATENT OFFICE	
PCT INTERNATIONAL APPLICATION	
Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference (if desired) (12 characters maximum) PC324PR	

Box No. I TITLE OF INVENTION

"Chewing gum"

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

PERFETTI S.p.A.
Via XXV Aprile 7,
I-20020 LAINATE (Milano) Italy

This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:

IT

State (that is, country) of residence:

IT

This person is applicant all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

COLLE, Roberto
Via Giotto Res. Fiori 221,
I-20080 BASIGLIO (Milano) Italy

This person is:

applicant only

applicant and inventor

inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

IT

State (that is, country) of residence:

IT

This person is applicant all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box

Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

agent

common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

RAMBELLINI, Paolo (IT); JACOBACCI, Filippo (IT); JACOBACCI, Guido (IT); QUINTERNO, Giuseppe (IT); GERBINO, Angelo (IT), SERRA, Francesco (IT); FIORAVANTI, Corrado (IT);
all c/o JACOBACCI & PERANI S.p.A., Corso Regio Parco 27,
I-10152 TORINO (Italy)

Telephone No.

(39) (011) 2440311

Facsimile No.

(39) (011) 286300 / 286676

Teleprinter No.

Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Sheet No. 2

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

FUGANTI, Claudio
Via G. B. Nazari 8,
I-20129 MILANO (Italy)

This person is:

applicant only
 applicant and inventor
 inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

IT

State (that is, country) of residence:

IT

This person is applicant for the purposes of:

 all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

applicant only
 applicant and inventor
 inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

 all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

applicant only
 applicant and inventor
 inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

 all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

applicant only
 applicant and inventor
 inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

 all designated States all designated States except the United States of America the United States of America only the States indicated in the Supplemental Box Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT

EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT

EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT

OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

<input checked="" type="checkbox"/> AE United Arab Emirates	<input checked="" type="checkbox"/> LC Saint Lucia	
<input checked="" type="checkbox"/> AG Antigua and Barbuda	<input checked="" type="checkbox"/> LK Sri Lanka	
<input checked="" type="checkbox"/> AL Albania	<input checked="" type="checkbox"/> LR Liberia	
<input checked="" type="checkbox"/> AM Armenia	<input checked="" type="checkbox"/> LS Lesotho	
<input checked="" type="checkbox"/> AT Austria	<input checked="" type="checkbox"/> LT Lithuania	
<input checked="" type="checkbox"/> AU Australia	<input checked="" type="checkbox"/> LU Luxembourg	
<input checked="" type="checkbox"/> AZ Azerbaijan	<input checked="" type="checkbox"/> LV Latvia	
<input checked="" type="checkbox"/> BA Bosnia and Herzegovina	<input checked="" type="checkbox"/> MA Morocco	
<input checked="" type="checkbox"/> BB Barbados	<input checked="" type="checkbox"/> MD Republic of Moldova	
<input checked="" type="checkbox"/> BG Bulgaria	<input checked="" type="checkbox"/> MG Madagascar	
<input checked="" type="checkbox"/> BR Brazil	<input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia	
<input checked="" type="checkbox"/> BY Belarus	<input checked="" type="checkbox"/> MN Mongolia	
<input checked="" type="checkbox"/> BZ Belize	<input checked="" type="checkbox"/> MW Malawi	
<input checked="" type="checkbox"/> CA Canada	<input checked="" type="checkbox"/> MX Mexico	
<input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein	<input checked="" type="checkbox"/> MZ Mozambique	
<input checked="" type="checkbox"/> CN China	<input checked="" type="checkbox"/> NO Norway	
<input checked="" type="checkbox"/> CR Costa Rica	<input checked="" type="checkbox"/> NZ New Zealand	
<input checked="" type="checkbox"/> CU Cuba	<input checked="" type="checkbox"/> PL Poland	
<input checked="" type="checkbox"/> CZ Czech Republic	<input checked="" type="checkbox"/> PT Portugal	
<input checked="" type="checkbox"/> DE Germany	<input checked="" type="checkbox"/> RO Romania	
<input checked="" type="checkbox"/> DK Denmark	<input checked="" type="checkbox"/> RU Russian Federation	
<input checked="" type="checkbox"/> DM Dominica	<input checked="" type="checkbox"/> SD Sudan	
<input checked="" type="checkbox"/> DZ Algeria	<input checked="" type="checkbox"/> SE Sweden	
<input checked="" type="checkbox"/> EE Estonia	<input checked="" type="checkbox"/> SG Singapore	
<input checked="" type="checkbox"/> ES Spain	<input checked="" type="checkbox"/> SI Slovenia	
<input checked="" type="checkbox"/> FI Finland	<input checked="" type="checkbox"/> SK Slovakia	
<input checked="" type="checkbox"/> GB United Kingdom	<input checked="" type="checkbox"/> SL Sierra Leone	
<input checked="" type="checkbox"/> GD Grenada	<input checked="" type="checkbox"/> TJ Tajikistan	
<input checked="" type="checkbox"/> GE Georgia	<input checked="" type="checkbox"/> TM Turkmenistan	
<input checked="" type="checkbox"/> GH Ghana	<input checked="" type="checkbox"/> TR Turkey	
<input checked="" type="checkbox"/> GM Gambia	<input checked="" type="checkbox"/> TT Trinidad and Tobago	
<input checked="" type="checkbox"/> HR Croatia	<input checked="" type="checkbox"/> TZ United Republic of Tanzania	
<input checked="" type="checkbox"/> HU Hungary	<input checked="" type="checkbox"/> UA Ukraine	
<input checked="" type="checkbox"/> ID Indonesia	<input checked="" type="checkbox"/> UG Uganda	
<input checked="" type="checkbox"/> IL Israel	<input checked="" type="checkbox"/> US United States of America	
<input checked="" type="checkbox"/> IN India	<input checked="" type="checkbox"/> UZ Uzbekistan	
<input checked="" type="checkbox"/> IS Iceland	<input checked="" type="checkbox"/> VN Viet Nam	
<input checked="" type="checkbox"/> JP Japan	<input checked="" type="checkbox"/> YU Yugoslavia	
<input checked="" type="checkbox"/> KE Kenya	<input checked="" type="checkbox"/> ZA South Africa	
<input checked="" type="checkbox"/> KG Kyrgyzstan	<input checked="" type="checkbox"/> ZW Zimbabwe	
<input checked="" type="checkbox"/> KP Democratic People's Republic of Korea	Check-box reserved for designating States which have become party to the PCT after issuance of this sheet:	
<input checked="" type="checkbox"/> KR Republic of Korea	<input type="checkbox"/>	
<input checked="" type="checkbox"/> KZ Kazakhstan		

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Sheet No. 4

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:*	international application: receiving Office
item (1) (26.4.2000) 26 April 2000	TO2000A000394	ITALY		
item (2)				
item (3)				

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / EP	<input type="checkbox"/> Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):
	Date (day/month/year) Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:	This international application is accompanied by the item(s) marked below:
request : 4	1. <input checked="" type="checkbox"/> fee calculation sheet
description (excluding sequence listing part) : 9	2. <input checked="" type="checkbox"/> separate signed power of attorney
claims : 2	3. <input type="checkbox"/> copy of general power of attorney; reference number, if any:
abstract : 1	4. <input type="checkbox"/> statement explaining lack of signature
drawings :	5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): (1)
sequence listing part of description :	6. <input type="checkbox"/> translation of international application into (language):
Total number of sheets : 16	7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material
	8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form
	9. <input type="checkbox"/> other (specify):

Figure of the drawings which
should accompany the abstract:

Language of filing of the
international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



RAMBELLI, Paolo

For receiving Office use only		
1. Date of actual receipt of the purported international application: (16.02.01)	16 FEB 2001	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only

Date of receipt of the record copy
by the International Bureau:

See Notes to the request form

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 November 2001 (01.11.2001)

PCT

(10) International Publication Number
WO 01/80661 A1

(51) International Patent Classification⁷: **A23G 3/30**

(21) International Application Number: **PCT/EP01/01762**

(22) International Filing Date: 16 February 2001 (16.02.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
TO2000A000394 26 April 2000 (26.04.2000) IT

(71) Applicant (for all designated States except US): **PERFETTI S.P.A. [IT/IT]; Via XXV Aprile, 7, I-20020 Lainate (IT).**

(72) Inventors; and

(75) Inventors/Applicants (for US only): **COLLE, Roberto [IT/IT]; Via Giotto Res. Fiori, 221, I-20080 Basiglio (IT). FUGANTI, Claudio [IT/IT]; Via G.B. Nazari, 8, I-20129 Milano (IT).**

(74) Agents: **RAMBELLI, Paolo et al.; Jacobacci & Partners S.p.A, Corso Regio Parco, 27, I-10152 Torino (IT).**

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/80661 A1

(54) Title: CHEWING GUM CONTAINING ENCAPSULATED ABRASIVE FILLER SUBSTANCE

(57) Abstract: A chewing gum composition including an abrasive filler substance, the said abrasive filler substance being encapsulated in cross-linked alginate microspheres.

CHEWING GUM CONTAINING ENCAPSULATED ABRASIVE FILLER SUBSTANCE

The present invention relates to a chewing gum composition including an abrasive substance, useful for oral hygiene and particularly for the removal and the prevention of the formation of dental plaque.

In the prior art chewing gum compositions are known containing abrasive substances which are described as useful for inhibiting or reducing dental plaque in the oral cavity.

US 4 400 372 describes a chewing gum composition containing a gum base, at least one source of non-toxic acid and particles of calcined kaolin having an average diameter of 2 μm and where substantially all the particles have a diameter less than about 20 μm . As described, the chewing gum composition, upon mastication, performs a cleaning action on the dental enamel and inhibits the reformation of plaque.

US 4 828 820 describes a chewing gum composition able to remove dental plaque, which contains from 20% to 40% by weight of an abrasive of calcium carbonate having a specific grain size.

WO 97/02009, in turn, describes a gum base composition which includes an intimate mixture of an elastomer and of abrasive silica, where the abrasive silica has an average particle size lying between 1 and 8 μm .

A common problem inherent in all the chewing gum compositions containing abrasive substances is that of achieving an effective cleaning action upon chewing, naturally avoiding

the damage to the enamel of the teeth and likewise avoiding an unpleasant organoleptic sensation of earthiness.

For this reason the main parameters which are taken into consideration in the formulation of gum base compositions and of chewing gum are essentially the nature of the abrasive agent, its grain size and the quantity for incorporation in the gum.

For the purpose of resolving the above-stated problems the subject of the present invention is a chewing gum including a filler of abrasive substance which is characterised in that the said abrasive substance is included in microspheres of cross-linked alginate.

Thanks to the said characteristic the microgranules of abrasive substance, embedded in the alginate matrix material, are particularly protected in the initial chewing of the chewing gum; thus, in this initial chewing phase, an unpleasant sensation of earthiness on the palate is avoided; moreover, since the microspheres are relatively fragile, they break up directly upon contact with the teeth during the chewing, releasing the abrasive substances at the site at which they are to perform their abrasive action in a progressive manner.

The preparation and use of encapsulates based on hydrocolloids and particularly alginate has already been described in the patent literature, for the purpose of encapsulating active principles such as sweetener, flavourings and pharmaceuticals, to achieve a prolonged and delayed release of such active principles.

EP-A-0 202 819 describes a release system for chewing gums, which comprises an active agent rendered insoluble in a matrix of cross-linked hydrocolloids based on alginates or carraginates of polyvalent cations.

This release system is utilised for encapsulating active agents such as, in particular, essential oils, sweeteners and pharmaceuticals. However, there is no indication of the possibility, and even less of the convenience, of encapsulating in alginate an abrasive substance useful for the purposes of prevention and removal of dental plaque.

As mentioned, the microspheres of alginate used in the scope of the present invention typically have an alginate matrix in which the granules of abrasive substance are dispersed; it is however also contemplated, within the scope of the definition of microspheres, that the granules of abrasive substance be covered by a film of alginate.

The microspheres preferably have a size, expressed as equivalent average diameter, lying between 0.6 and 1.5 mm; it is, however, preferable that such microspheres should have a relatively narrow grain size distribution curve, for example with equivalent average diameter lying between 1,000 and 1,200 μm .

The relative proportion of abrasive granular substance with respect to alginate is preferably between 80-99% by weight of abrasive substance and correspondingly 20-1% by weight of alginate.

The microspheres may however encapsulate smaller percentages of active agents, in particular flavourings, colouring and

active principles for the care and treatment of the teeth, the percentage by weight, referred to 100 parts by weight of alginate and microgranules, generally does not exceed values between 0.1% and 1% by weight.

The abrasive granular substances included in the microspheres are typically filler materials such as, for example, abrasive silica, talc, kaolin, calcium carbonate, but may also include other solid abrasive materials including therein organic substances which have an adjuvant mechanical action in the removal of plaque as long as such substances are admitted by the current laws for incorporation into chewing gums.

Typically, the particles of abrasive substance have an equivalent average diameter lying between 2 and 100 μm , values lying between 4 and 60 μm being preferred, and between 6 and 10 μm even more preferred.

A preferred material is abrasive silica of the type used as abrasive filler in toothpaste formulations.

Mixtures of abrasive substances can also be utilised, such as, for example, particles comprising a core of calcium carbonate and a shell of silica as described in WO 97/39728, or mixtures of silica-calcium carbonate, silica-talc-calcium, carbonate, silica-talc, or calcium carbonate-talc.

The procedures for the preparation of alginate microspheres are known per se and exploit the property of alginates which are hydrosoluble as monovalent cations, such as sodium and potassium, to give rise to reactions of ionic substitution with polyvalent cations to form a gel which - when the

substitution is completed - form a cross-linked precipitate insoluble in water.

Within the scope of the present invention calcium ions are utilised as polyvalent cations which are added to an aqueous solution of hydrosoluble alginate (particularly sodium alginate) in the form of salts.

Thus, for example, the preparation of the microspheres contemplates the introduction into an aqueous solution of calcium chloride of an aqueous solution of sodium alginate, containing, in dispersion or in suspension, an inert abrasive material and possibly one or more active principles which can be loose or suspended or dispersed in the alginate solution.

A colourant chosen from among those admitted by food legislation, can be included in the aqueous solution of calcium chloride or in the solution of sodium alginate for the purpose of achieving its incorporation in the microspheres to obtain coloured microspheres. In particular, the aqueous solution of alginate containing the abrasive non-hydrosoluble material is supplied through a nozzle into the aqueous solution of calcium chloride, whilst controlling the rate of addition and the conditions of agitation for the purpose of obtaining microspheres having the desired grain size.

The microspheres of calcium alginate which form in this manner incorporate within their interior the inert material and/or the active principles present in the two solutions which are mixed. For the purpose of encouraging and accelerating cross-linking of the alginate the addition of an acid as a cross-linking initiator can be contemplated.

The active principles which can be added to the solution of alginate in order to be encapsulated in the microspheres comprise in particular fluorine ions in the form of a fluoride salt acceptable for food use, salts of phosphorus and calcium, salts or phosphorous and calcium bound in a stable or metastable manner to phosphoproteins such as, for example those present in hydrolysed casaein, as well as flavourings substances which - advantageously - correspond to the flavourings present in the hydrosoluble part of the chewing gum.

Moreover, alimentary integrators, vitamins and intensive sweeteners can be included as active principles.

In the procedure for preparation of the microspheres these latter are recovered from the reaction mass by means of filtration and are subsequently washed with water and dried to an appropriate moisture content; the preferred moisture content lies between 0.1% and 5% by weight - referred to the weight of the microsphere, in that with this moisture content it has been found that the microspheres are sufficiently tenacious to resist intact the mechanical washings necessary for the production of chewing gum, but simultaneously sufficiently fragile that upon chewing they break up on the surface of the tooth, assisting in the mechanical removal of the plaque and releasing the desired active principles onto the surface of the teeth.

The microspheres thus obtained, preferably having the above stated moisture content, are incorporated in a chewing gum composition typically in concentrations from 1% to 10% by weight referred to the total weight of the composition or preferably between 3% and 5% by weight.

The preparation of the chewing gum is effected by means of conventional methods utilising commercially available gum bases.

Typically, the gum bases utilised comprise:

- From 5% to 50% by weight of naturally occurring synthetic elastomers, particularly polyisobutylene, isobutbutylene - isoprene copolymer and butadiene-styrene;
- From 5% to 60% by weight of resin acting as elastomer plasticisers, including polyterpene resins, colophony esters and polyvinylacetate of high or low molecular weight;
- From 5% to 40% of softening agents (softeners) chosen from among the microcrystallene waxes, hydrogenated or partially hydrogenated vegetable oils and their mixtures;
- From 1% to 15% by weight of emulsifiers such as lecithin, mono- and di-glyceride acetates and triacetates; and
- From 0% to 60% by weight of optional fillers chosen from the fillers conventionally utilised in the preparation of the gum base.

The chewing gum can be prepared by means of a conventional process of mixing the gum base with the alginate microspheres, filler, sweeteners, flavourings and further high or low intensity sweeteners and possible plastisisers. Preferably, the chewing gum compositions have a water content not greater than 5% by weight.

Example 1

An aqueous solution of sodium alginate was prepared containing from 1% to 10% by weight of alginate, in the specific case 5% by weight of sodium alginate. To this solution silica particles (Syloid AL1 F.P.®, Grace Company) were added having a grain size lying between 6.0 and 7.6 μm , the quantity being about 40% by weight referred to the weight of the aqueous solution. The suspension of alginate and silica solutions, maintained homogeneous by agitation, is introduced in the form of minute droplets via a nozzle into an aqueous solution of calcium chloride at 1% by weight, subjected to slow agitation. Upon coming into contact with the calcium chloride the droplets of sodium alginate - containing the inert silica - transform into droplets of calcium alginate which enclose the inert silica. After about five minutes the supernatant is decanted from the precipitated microspheres and these are filtered through a mesh filter having a mesh size of 1 mesh. The microspheres are washed on a filter with a little water and dried in an oven under vacuum at 50°C to a water content of about 3%-5% by weight.

Example 2

The same procedure as described in example 1 utilising, in place of the silica carbonate of calcium and talc respectively having a grain size substantially corresponding to that of the silica utilised in the proceeding example.

Example 3

Procedure as in Example 1, adding a food colouring to the silica in concentrations lying between 0.1% and 10% referred

to the weight of the aqueous solution of alginate; proceeding as in example 1 coloured microspheres are obtained.

Example 4

Proceeding as in Example 1, adding to the solution of sodium alginate an active principle represented by potassium flouride in quantities of from 0.1% to 10% by weight referred to the weight of the aqueous solution of alginate.

The microspheres obtained according to the above - described examples were utilised for the production of chewing gum containing from 15% to 50% by weight of gum base, from about 20% to about 60% of sweetening fillers, 0.5% - 15% of plasticisers and from 1% to 10% of alginate microspheres including, moreover, flavourings and sweeteners, preferably high intensity.

CLAIMS

1. A chewing gum composition including an abrasive filler substance, characterised in that the said abrasive filler substance is encapsulated in microspheres of cross-linked alginate.
2. A chewing gum composition according to Claim 1, characterised in that the said microspheres have an equivalent average diameter lying between 0.6 and 1.5 mm.
3. A chewing gum composition according to Claim 1, characterised in that the said microspheres have an equivalent average diameter lying between 1 and 1.2 mm.
4. A chewing gum composition according to any of Claims 1 to 3, characterised in that the said microspheres are present in quantities from 1% to 10% by weight referred to the weight of the chewing gum.
5. A chewing gum composition according to any preceding claim, characterised in that the said abrasive substance is chosen from abrasive silica, calcium carbonate, talc and mixtures thereof.
6. A chewing gum composition according to Claim 5, characterised in that the said abrasive filler substance is present in particles having dimensions, expressed as equivalent average diameter, lying between 2 and 100 μm .
7. A chewing gum composition according to Claim 6, characterised in that the said abrasive filler substance has a particle size lying between 6 and 10 μm .

8. A chewing gum composition according to any preceding claim, characterised in that the said microspheres comprise from 80% to 99% by weight of abrasive filler substance.

9. A chewing gum composition according to any preceding claim, characterised in that the said microspheres further include ingredients chosen from flavourings, sweeteners, active agents and mixtures thereof.